DOCUMENT RESUME

ED 292 286 EC 202 069

AUTHOR Bradley, Robert H.; And Others
TITLE General and Specific Aspects of the Physical Environment: Relationships with Development in Handicapped Children Ages 1 to 10.
PUB DATE Apr 87
NOTE 16p.; Paper presented at the Bienniel Meeting of the Society for Research in Child Development (Baltimore, MD, April 23-26, 1987).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Behavior Development; *Disabilities; Early Childhood Education; Environmental Influences; Family Attitudes; *Family Environment; Family Life; Family Relationship; Hearing Impairments; *Instructional Materials; Mental Retardation; *Motor Development; Physical Disabilities; *Social Development; Speech Handicaps; Toys; Visual Impairments

ABSTRACT

The relationship between physical environment and child development was examined in five groups of moderately to severely handicapped children (hearing impaired, vision impaired, orthopedically impaired, speech impaired, mentally retarded). The 282 participating children comprised 89 infants (ages 0-3), 108 preschoolers (ages 3-6), and 85 elementary school children (ages 6-10). Each child's family was visited twice (18 months apart) at home and assessed using sociodemographic indices, the HOME Inventory, a parental coping scale, a social support inventory, the Family Inventory of Life Events, the Scales of Independent Behavior, and either the Bayley Scales of Infant Development or the Stanford-Binet Intelligence test. Results indicated that there was a high degree of specificity between the type of handicap and age and the development of handicapped children. Availability of materials was only slightly related to behavioral development in infants but more significant in overall development of preschool and elementary school age children. Significant correlations were most frequent for orthopedically and speech impaired children's motor and social development, while no significant correlations appeared for the mentally retarded in any developmental area. Findings also indicated that general surroundings in which a child lives were essentially unrelated to behavioral development for handicapped children ages 0-10. (VW)

General and Specific Aspects of the Physical Environment: Relationships with Development in Handicapped Children Ages 1 to 10

Robert H. Bradley, Stephen L. Rock & Bettye M. Caldwell
Center for Research on Teaching & Learning
University of Arkansas at Little Rock

Presented as part of a symposium, "Contributions of the Physical Environment to Children's Levelopment". Bienniel meeting of the Society for Research in Child Development, Baltimore, MD. April 23-26, 1987

The 1960's was a watershed decade for conceptualizing the relationship between environment and development in young children. It began with Hunt's (1961) seminal volume on experience and development in which he carefully articulated the importance of having a "match" between a child's needs and capabilities and what the environment offers by means of stimulation and support. It continued with Bloom's (1964) promulgation of the kinds of historical and contextual circumstances which help to determine how "powerful" an environment is in influencing development, and his debunking of the notion that status or class designations alone provide adequate descriptions of the actual living conditions of particular children. It ended with Caldwell's (1968) detailed descriptions of the specific kinds of objects, events, and transactions needed to promote "optimal development". These three works set the stage for: (a) a series of early intervention experiments in which attempts were made to alter conditions inimical to development; (b) a series of longitudinal investigations aimed a delineating the relationship between development and specific features of the environment; and (c) the development of a number of environmental measures that provide information about specific aspects or processes in the child's home environment. These efforts have led to a more adequate data base regarding the relationship between environment and development in young children (see, for example, Wachs & Gruen, 1982; Bradley & Tedesco, 1982; Kagan, 1984; Gottfried, 1984). They have also led to more comprehensive conceptualizations regarding the relationship between environment and development (see, for example, Wohlwill, 1973; Wachs & Gruen, 1982; Sameroff, 1982; Kagan, 1984; Ramey and Baker-Ward, 1982; Bronfenbrenner, 1979).

One of the outgrowths of advances in the study of environment/ development relationships over the past 25 years has been careful investigations of the influence of particular aspects of the home environment on children's development (eg., Wachs and his colleagues on aspects of the physical environment; Ramey and his colleagues on contingent stimulation; Yarrow and his colleagues on responsivity of stimulation; and Bradley & Caldwell and their colleagues on play materials and social responsivity). From the standpoint of a "history" of scientific development in the field of environment/development relationships, the move to detailed investigations of rather specific aspects of the relationship is timely. Together with the complementary move to integration of this field into broader models of environment/ development relationships, the field is simulateously gaining greater depth and breadth of understanding about these basic relationships.

Wachs and his colleagues have led the way in providing greater depth to our understanding of how physical objects and physical surroundings in the home environment influence the development of young children. There is a small, but growing data base, in this area (see, for example, the meta-analysis provided by Gottfried, 1984). However, most of the findings pertain to normal children under the age of three. The purpose of the current study is to add to the data base by examining the relationship of the physical environment to children's development among a group of handicapped children ages 1 to 10. Specifically, it attempts

to examine the relationship between the physical environment and development in five groups of children (hearing impaired, vision impaired, orthpedically impaired, speech impaired, mentally retarded) whose requirements from the physical environment may differ both from each other and from non-handicapped children. Moreover, it attempts to investigate the relative importance of features of the physical environment that are manipulable and that rather directly involve the child (such as toys and household objects) versus those that are more general setting conditions of the home (such as the amount of clutter, the degree of safety in arrangement of objects, the adequacy of lighting).

Method

Sample

A total of 282 children, ages 1 to 10, participated in the study. 89 were infants (birth to three), 108 were preschoolers (three to six); and 85 were elementary school age (six to ten). A wide variety of handicapping conditions were present in the sample: 58 hearing impaired, 66 vision impaired, 107 orthopedic impaired, 176 mentally retarded. Since the focus was on children with moderate to severe degrees of impairment, quite a few of the children had multiple disabilities.

The majority of the children lived in central Arkansas. They were

recruited with the assistance of a number of schools and agencies in the area, including the Little Rock, Pulaski County, and North Little Rock school districts, Arkansas Developmental Disabilities Services, Arkansas School for the Deaf, Easter Seals, Arkansas School for the Blind, Frances Allen Exceptional School, the Developmental Clinic of Arkansas Children's Hospital, the Speech and Language clinic of the University of Arkansas at Little Rock, the Developmental Early Education Program of UALR, Archild, the Civitan center in Benton Arkansas, United Cerebral Palsy. All of the participants were receiving some type of service to assist their development, but none were permanently institutionalized. A few of the participating children lived at Arkansas School for the Blind during the week, but were sent home most weekends and holidays and for longer periods of time during the summer.

Participation was voluntary. Families were paid a small stipend ($10.00) for each assessment session.

Instruments

Each family was visited twice (18 months apart) in the home where parent and child were assessed with a battery of instruments. These included sociodemographic indices, the HOME Inventory, a parental coping scale, a social support inventory, the Family Inventory of Life Events, the Scales of Independent Behavior, and either the Bayley Scales of Infant Development or the Stanford-Binet Intelligence test. For

purposes of this report, only the HOME Inventory and the child developmental measures will be described.

HOME Inventory. Each family was administered the HOME Inventory during both home visits. There are currently three versions of the HOME: one designed for families of infants (ages birth to 3), one for preschoolers (3 to 6), and one for elementary age children (6 to 10). All three versions are administered in the home at a time when both the child and the child's primary caregivers are present. Information needed to score the items on the Inventory is collected using a combination of observation and semi-structured interview. All items are scored in binary ("yes" - "no") fashion.

The Infant HOME contains 45 items clustered into six subscales: (1) parental responsivity, (2) acceptance of child, (3) organization of the environment, (4) play materials, (5) parental involvement, and (6) variety of stimulation.

The Preschool HOME contains 55 items clustered into eight subscales: (1) learning materials, (2) stimulation of communication skills, (3) physical environment, (4) pride, affection and warmth, (5) stimulation of academic behavior, (6) encouragement of social maturity, (7) variety of experience, and (8) acceptance of child.

The Elementary HOME contains 59 items clustered into eight subscales: (1) parental responsivity, (2) encouragement of maturity, (3) emotional climate, (4) learning materials & experiences, (5) provision for active stimulation, (6) family participation in developmentally stimulating experiences, (7) paternal involvement, and (8) physical environment.

In addition to administering the HOME Inventory to all participating families, the research assistants assessed the physical environment of the home (both internal and immediate external) using an 8-item scale modeled after the HOME Inventory.

Results

Infancy

Play Materials. Table 1 displays the correlations between physical environment measures and children's behavioral development for the infancy period (ages birth to three). As the table shows, there were few significant correlations between the availability of appropriate Play Materials and Bayley MDI scores. Relations with other measures of behavioral development were sporadic, with two groups (visually impaired, hearing impaired) showing significant correlations with the Motor and Social scales from the SIB.

General Surroundings. As Table 1 reveals, there was little relationship between children's behavioral development and their general physical environment. The only exception was a negative (-.39)

correlation with Personal development for visually impaired children.

Early Childhood

Learning Materials. Table 2 displays the correlations between physical environment measures and children's behavioral development for the early childhood period (ages three to six). For two groups (orthopedically impaired, speech impaired), there was as significant correlation between the availability of useful Learning Materials and IQ. There was a borderline correlation (.26) for a third group (hearing impaired). Learning Materials was also correlated with the Social scale from the SIB for the same three groups (.30 to .48). All of the subscales from SIB were related to Learning Materials for orthopedically impaired preschoolers.

General Surroundings. Table 2 shows that there was little relationship between children's general surroundings and their behavioral development during the preschool period. The three significant relationships were all negative (-.33 to -.38).

Early School Age

Learning Materials. Table 3 displays the correlations between physical environment measures and chileren's behavioral development during the early elementary grades (ages six to ten). For two groups (visually impaired, speech impaired) the correlation with IQ was significant (.48, .40). For a third group (orthopedically impaired), it was borderline (.29). All of the SIB scales were related to Learning

Materials in the combined group. However, none was significant for mentally retarded and hearing impaired groups.

General Surroundings. There were only two significant correlations between children General Surroundings and their behavioral development. Both were for mentally retarded children and both were negative (-.37).

Discussion

Among the handicapped infants studied, the availability of useful Play Materials bore only a slight relationship to behavioral development. For hearing impaired and vision impaired infants, there is some evidence that Play Materials is related to development, mostly in the domains of motor and social development. There was more substantial evidence that the availability of Learning Materials during the preschool and early school age periods is related to children's development. The two groups showing the greatest number of significant correlations were orthopedically impaired and speech impaired. The one group which showed no significant correlation was mentally retarded. IQ and the Social scale from SIB showed the greatest number of significant associations with Learning Materials. In sum, there appears to be a rather high degree of specificity in the relationship between the availability of developmentally stimulating materials and development of handicapped children during the first ten years of life. Some handicapped groups (i.e., orthopedically impaired, speech impaired) show patterns reminiscent of non-handicapped children; whereas other

handicapped groups (i.e., mentally retarded) show patterns at great variance with non-handicapped. There appears also to be differences in patterns of correlations as a function of age. Most groups show stronger relationships between Learning Materials and behavioral development after the infancy period, the clearest exception being hearing impaired. The availability of manipulable items -- and perhaps the social context in which those materials are often imbedded -- may not be as useful for developing the verbal and reasoning competencies of hearing impaired children as they are for other handicapped children.

A somewhat surprising finding from this study is that the general surroundings in which a child lives was essentially unrelated to behavioral development for handicapped children during the first ten years of life. The pattern of correlations revealed in Tables 1 through 3 is so sporadic that interpretations are difficult. The most notable finding is that all significant correlations -- a total of 7 out of 90 possible -- were negative (between -.33 and -.39). This limited negative finding may suggest a somewhat different pattern of services for handicapped children as a function of economic status.

In sum, the pattern of correlations between the availability of material objects and children's behavioral development suggests that most handicapped children -- like most non-handicapped children -- benefit from opportunities to interact with responsive and stimulating objects. However, the correlations presented cannot be interpreted

causally. To some extent, parents probably provide more stimulating materials to children who they judge are more competent to use them. However, the lack of significant correlations for certain handicapped groups suggests that parents' decisions to provide materials are not heavily determined by differences in child competence.

Most revealing in this study are findings pertaining to mentally retarded children (largely moderate to severe retardation). There were no significant correlations with the availability of materials. These findings may indicate that the physical environment measures used were not sufficiently sensitive to detect any beneficial "effect" of materials. More likely, they reveal limitations in the capacity of MR children (Rocassino & Yatchmink, 1983) to effectively use the materials. What MR children probably need in order to benefit from exposure to objects is a greater amount of assistance and "mediation" on the part of parents and other adults.

With respect to the relationship between the availability of play and learning materials to children's behavioral development among handicapped children, the following may be useful areas for further research: (1) the instructional/social context in which materials are made available and used for mentally retarded children; (2) the social/instructional context for learning materials among hearing impaired children once they reach school age; and (3) the potential value of toys which stimulate through auditory and tactile channnels for preschool age visually impaired children. These areas of investigation should not only be useful from the standpoint of theory building but also because the findings may result in rather immediate implications for interventions.

References

Bloom, B. (1964). Stability and change in human characteristics. New York: W. Sons.

Bradley, R., & Tedesco, L. (1982). Environmental correlates of mental retardation. In. J. Lachenmeyer & M. Gibbs (Eds.), Psychology of the abnormal child. New York: Gardner Press.

Bronfenbrenner, U. (1979). The ecology of human development. Cambridge, Mass.: Harvard University Press.

Caldwell, B. (1968). On designing supplementary environments for early child development. BAEYC Reports, 10, 1-11.

Gottfried, A. (1984). Home environment and early cognitive development. New York: Academic Press.

Kagan, J. (1984). The nature of the child. New York: Basic Books.

Ramey, C. & Baker-Ward, L. (1982). Psychosocial retardation and the early experience paradigm. In D. Bricker (Ed.), Intervention with at risk and handicapped infants. Baltimore: University Park Press.

Rocassino, K. & Yatchmink, Y. (1983). Language skill and interactive patterns in prematurely born toddlers. Child Development, 54, 1229-1241.

Wachs, T. & Gruen, G. (1982). Early experience and human development. New York: Plenum Press.

Wohlwill, J. (1973). The study of behavioral development. New York: Academic Press.

Table 1

The Physical Environment and Behavioral Development among Handicapped Infants

Physical Environment Measures	Scales of Independent Behavior				Bayley
	Motor	Social	Personal	Community Living	MDI
Play Materials					
All (N=105)	07	07	03	-02	06
MR (N=56)	09	07	01	00	19
HI (N=16)	63*	60*	13	-28	45*
VI (N=34)	32*	39*	16	20	02
OI (N=50)	08	08	02	02	18
SI (N=17)	-11	-08	-11	-07	-77*
Gen. Surroundings					
All	-04	03	02	02	-04
MR	-01	05	06	05	-08
HI	01	09	-36	-15	33
VI	04	09	-39*	04	-14
OI	02	05	09	08	-17
SI	20	22	19	22	-32

* $p < .05$

Table 2

The Physical Environment and Behavioral Development among Handicapped Preschoolers

Physical Environment Measures	Scales of Independent Behavior: Motor	Social	Personal	Community Living	IQ
Learning Materials					
All (N=131)	13	27*	13	18	28* MR
(N=69)					
05	17	12	12	18	
HI (N=29)	-01	32*	-10	01	26
VI (N=36)	11	15	06	-02	-04
OI (N=44)	45*	48*	50*	52*	54*
SI (N=76)	19	30*	12	23	43*
Gen. Surroundings					
All	-17	-07	-16	-08	08
MR	-17	-10	-13	-15	-04
HI	-37*	-16	-38*	-13	25
VI	-10	-15	-17	-33*	-25
OI	10	09	16	16	12
SI	-11	-03	-19	-01	11

* $p < .05$

Table 3

The Physical Environment and Behavioral Development among Handicapped Elementary School Children

Physical Environment Measures	Scales of Independent Behavior				IQ
	Motor	Social	Personal	Community Living	
Learning Materials					
All (N=75)	27*	40*	24*	39*	36*
MR (N=40)	08	15	-07	20	06
HI (N=21)	23	17	12	21	-06
VI (N=15)	38	36	33	41	49*
OI (N=27)	17	43*	09	33*	29
SI (N=33)	22	43*	20	32*	48*
Gen. Surroundings					
All	07	07	06	03	06
MR	-26	-26	-24	-37*	-37*
HI	19	16	26	14	-04
VI	12	-04	-03	-03	23
OI	-04	-08	-02	-05	-14
SI	08	16	05	04	12

* $p < .05$